



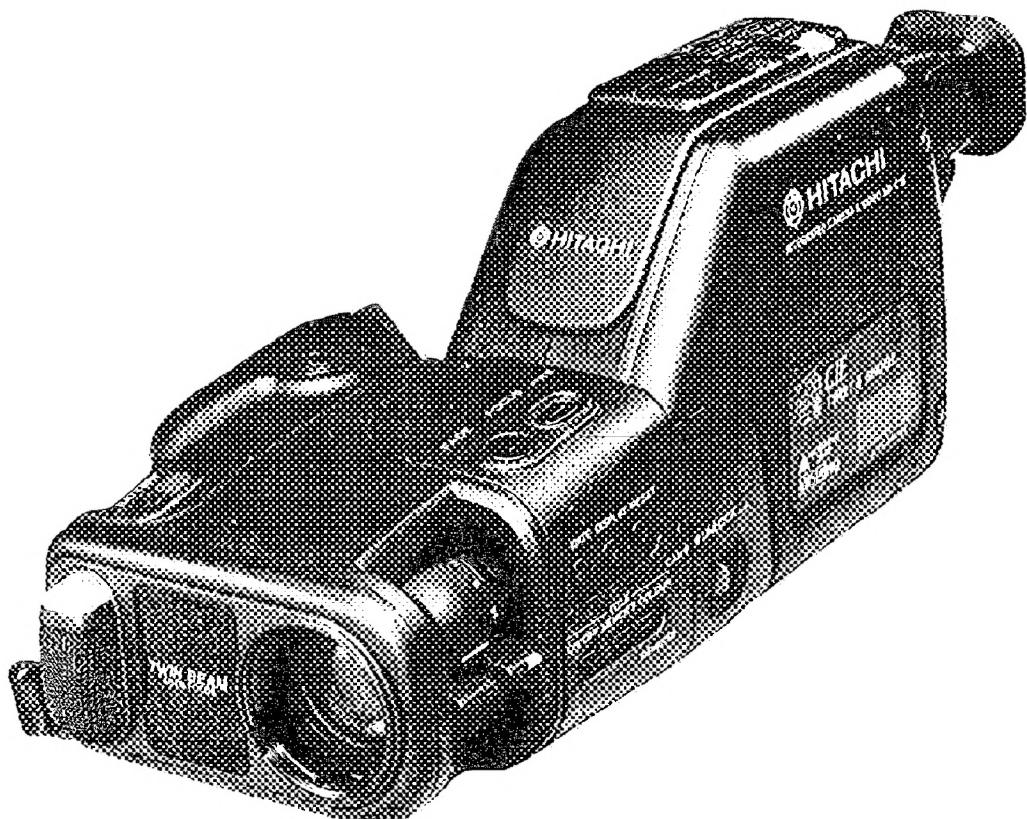
**HITACHI**



V03628

# VIDEO CAMERA/RECORDER

## VM-C1E



### **Instruction manual**

To obtain the best performance and ensure years of trouble-free use, please read this instruction manual completely.



## PRECAUTION

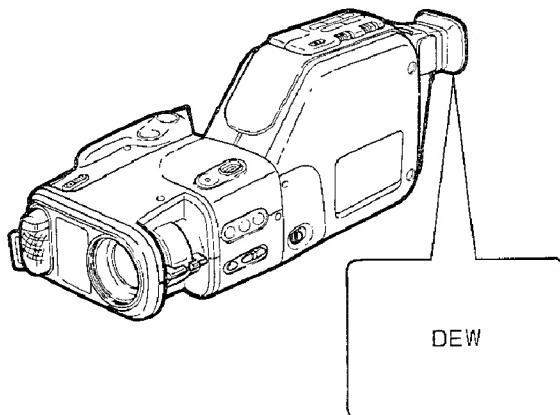
### ■ No water, dust or sand

Be careful that no water, dust or sand enters the camera/recorder because it may cause trouble and accidents.

### ■ Do not leave the viewfinder lens facing sunlight for a prolonged period, or the phosphorescent surface of the cathode ray tube may be damaged.

#### Moisture condensation

"DEW" in the viewfinder of the camera/recorder indicates that there is condensation on the recorder mechanism. If the camera/recorder is moved from a cold area to a warm area and the humidity is high, moisture can form on the metal surface of the recording mechanism. If this happens, the tape could be damaged. To prevent damage the camera/recorder will not operate except for EJECT. Should "DEW" appear with the power on, press EJECT and remove the cassette. Wait for the moisture to dry (until "DEW" goes off).



**BE SURE NOT TO LEAVE IT IN A PLACE AT HIGH TEMPERATURE EXCEEDING 50°C, OR ITS INTERNAL PARTS MAY DETERIORATE. BE CAREFUL NOT TO LEAVE THE UNIT IN THE FOLLOWING PLACES:**

- \* Inside a car with the window closed and in direct sunshine.
- \* Near heating appliances.
- \* In direct sunshine in summer.

This product is manufactured to comply with the radio interference requirements of EEC Directive 76/889/EEC & 82/499/EEC, 87/308/EEC.

## FEATURES

### Super slim at 69 mm

Because the twist mechanism is used, the thickness is reduced to 69 mm when the camera grip is twisted. This is convenient when carrying the camera/recorder in an attaché case, etc.

### Single-Unit Convenience and Ease of Operation

Your VM-C1E video camera/recorder combines the functions of a video camera and a video tape recorder in one lightweight, easy-to-use instrument. This eliminates interconnecting cables and simplifies operation.

### VHS Compact Video Cassette

In the interest of achieving a lighter and even more convenient to handle video camera/recorder, the VM-C1E has been designed to use the smaller and simpler VHS-C cassette. This not only reduces the weight, but actually allows the tape drive mechanism to be simplified and made more reliable.

The optional cassette adaptor allows playing back your tapes in a standard VHS VTR.

### Auto Focus Power Zoom Lens

The 6:1 autofocus zoom lens uses an infrared beam to automatically maintain focus and to allow you to zoom in and out for close-ups or wide angle shots at just the touch of the zoom button. Macro feature permits use as close as 1 cm from the subject.

### Dual Macro System

- **Tele Macro:** Auto focus operates even when the lens surface is brought 80 cm from a subject and gives the same effects as the conventional wide macro function.
- **Wide Macro:** You can record a subject up to 1 cm from the lens surface.

### Programme AE (Auto Exposure)

The camera automatically determines the shutter speed and aperture according to the brightness of the subject.

### Digital Image Generator Built-in

You can store a title in memory. You can recall the stored title from memory and superimpose it on a picture being recorded.

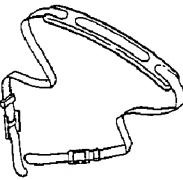
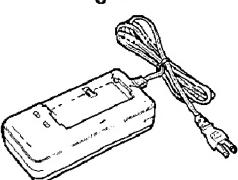
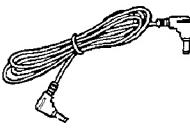
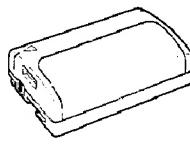
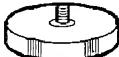
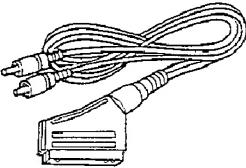
### Fade-in/Fade-out

Use this function to make the picture appear and disappear gradually.

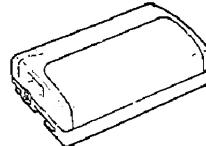
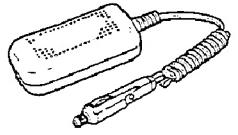
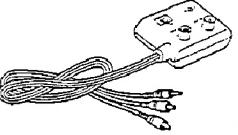
### Amorphous Heads and Flying Erase Head

Amorphous heads provide a clearer picture. The flying erase head eliminates glitches and rainbow noise that occurs at the joints between recordings.

## ACCESSORIES

① Shoulder Strap	② AC Adaptor/Charger	③ DC Cord	④ Battery Pack	⑤ Tripod Adaptor
				
⑥ Audio/Video Output Cable	⑦ Battery for Clock			<p><b>WARNING:</b> Keep this battery away from children. If swallowed, consult a physician immediately for emergency treatment.</p>
				

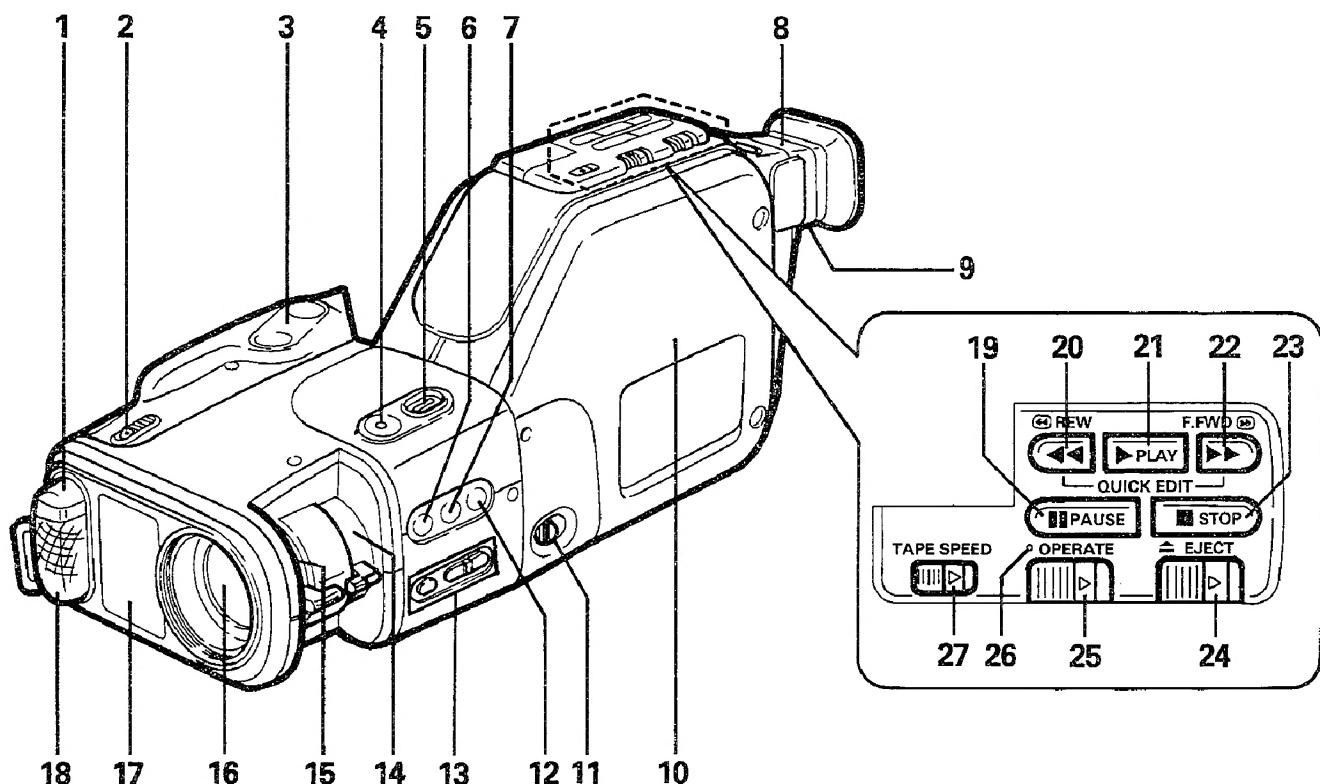
## OPTIONAL ACCESSORIES

Battery Pack	Car Battery Cord	RF Converter Unit	Cassette Adaptor	Battery Charger
				VM-BC80E

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## CONTROLS AND FUNCTIONS



### 1. 60 Hz Detection Sensor

When a subject is shot under fluorescent lighting in areas where the power frequency is 60 Hz (in U.S.A., Canada, etc.) flickering occurs in the picture. When this sensor detects 60 Hz, it changes the shutter speed automatically so that no flickering occurs.

**NOTE:** When a subject is shot under fluorescent lighting in areas where the power frequency is 50 Hz, the shutter speed is set to 1/50 automatically.

### 2. BATTERY Eject Lever

Release the battery attached to the video camera/recorder.

### 3. Power Zoom Switch

This switch performs zooming electrically.

"W": Picture becomes wider gradually.

"T": Picture becomes telescopic gradually.

### 4. FADE Button

During recording you can add a professional touch to your recordings by fading in and out of scenes.

**NOTE:** When you use FADE button to fade in and out, the sound will also fade in and out with the picture.

### 5. FOCUS Button

When adjusting the focus manually, press this button to make "F.MANUAL" appear in the viewfinder and then turn the focus ring to bring the subject into focus.

### 6. DATE Button

Press this button to display the date and clock in the viewfinder. Whenever the date and clock appear in the viewfinder, they will be recorded on the tape.

### 7. DISPLAY Button

Pressing this button once causes the battery indicator and the amount of remaining time appear in the camera/recorder viewfinder.

Pressing the button again will cause a 4-digit tape counter and battery indicator to appear.

Press the button a third time will cause memory mark "M" to appear. Press a 4th time to delete all displays.

### 8. Electronic Viewfinder (EVF)

Displays what the camera/recorder lens sees. The electronic viewfinder also functions as a convenient black-and-white monitor during playback of recorded material.

### 9. Diopter Control

To use the electronic viewfinder without eyeglasses on, turn this control knob for your optimum focus adjustment.

### 10. Cassette Holder

Slide EJECT switch to open the cassette holder. Be aware of the cassette direction when inserting.

**NOTE:** Power source must be connected to open the cassette holder.

## 11. UNLOCK Switch

To turn on the power of the camera, slide this switch in the direction of the arrow, and while holding it, twist the grip. This turns the camera on. To turn on the power of the VTR, slide the switch in the direction of the arrow, and while holding it, twist the grip in the opposite direction, then slide the OPERATE switch.

## 12. RESET Button

When the tape counter is displayed in the viewfinder, pressing this button resets the counter to "0000".

## 13. Titler Buttons

Use these buttons to store a title in memory or recall the stored title and record it superimposed on the picture being shot. See page 20 for details.

## 14. Zoom Ring (Manual Zooming)

The picture size can be magnified 6 times with the use of the zoom feature. Just rotate the zoom ring for a close up (T) or wide angle (W) picture. Macro close-up, as close as 1 cm from object, is feasible.

## 15. Focus Ring

Do not attempt to manually turn the focus ring when the camera/recorder is in the auto focus mode.

## 16. Lens

F1.8 (9.0 ~ 54.0 mm) 6:1 power zoom lens features with auto focus and auto iris functions.

## 17. Auto Focus Window

To automatically focus the camera lens, this window transmits and receives infrared light which is reflected off the subject. Make sure you don't obstruct this window when recording.

## 18. Microphone

Sensitive to sounds coming from the direction in which the camera is pointed.

## 19. PAUSE Button

This button is used to display a still picture during playback mode.

## 20. REW Button

Press this button during stop or fast forward mode, and fast-rewinding starts. "REWIND" indication appears in the viewfinder whenever the tape counter or time remaining is present. Press the button during playback of tape, and the tape is played back in the rewind direction approximately 3 times faster than the normal speed (SP recorded tape) or 7 times faster than the normal speed (LP recorded tape) to confirm the recorded contents. Press PLAY button to return to normal playback mode or press STOP button to stop tape movement.

NOTE: You can also visually scan backward when the camera/recorder is record/pause (stand-by) mode by pressing and holding this button.

## 21. PLAY Button

Used for playback of tape.

NOTE: When the camera/recorder is record/pause (stand-by) mode, pressing and holding this button will play the tape at normal.

## 22. F.FWD Button

Press this button during stop or rewind mode, and fast-forwarding starts. "FAST FWD" indication appears in the viewfinder whenever the tape counter or time remaining is present. Press the button during playback of tape, and the tape is played back in the forward direction approximately 3 times faster than the normal speed (SP recorded tape) or 7 times faster than the normal speed (LP recorded tape) to confirm the recorded content. Press PLAY button to return to normal playback mode or press STOP button to stop tape movement.

NOTE: You can also visually scan forward when the camera/recorder is record/pause (stand-by) mode by pressing and holding this button.

## 23. STOP Button

The STOP button is used to stop playback, rewind, and fast forward operations. The STOP button has no effect during record operation.

## 24. EJECT Switch

Slide to insert or remove the cassette.

## 25. OPERATE Switch

Slide this switch to turn on the VTR.

## 26. OPERATE/Dew Indicator Light

Flashing of the light indicates dew condensation on camera/recorder mechanism. While this light is flashing, the unit will not operate. If this occurs, eject the tape and leave the power on. When the light stops flashing, the unit can be operated.

## 27. TAPE SPEED Switch (LP/SP)

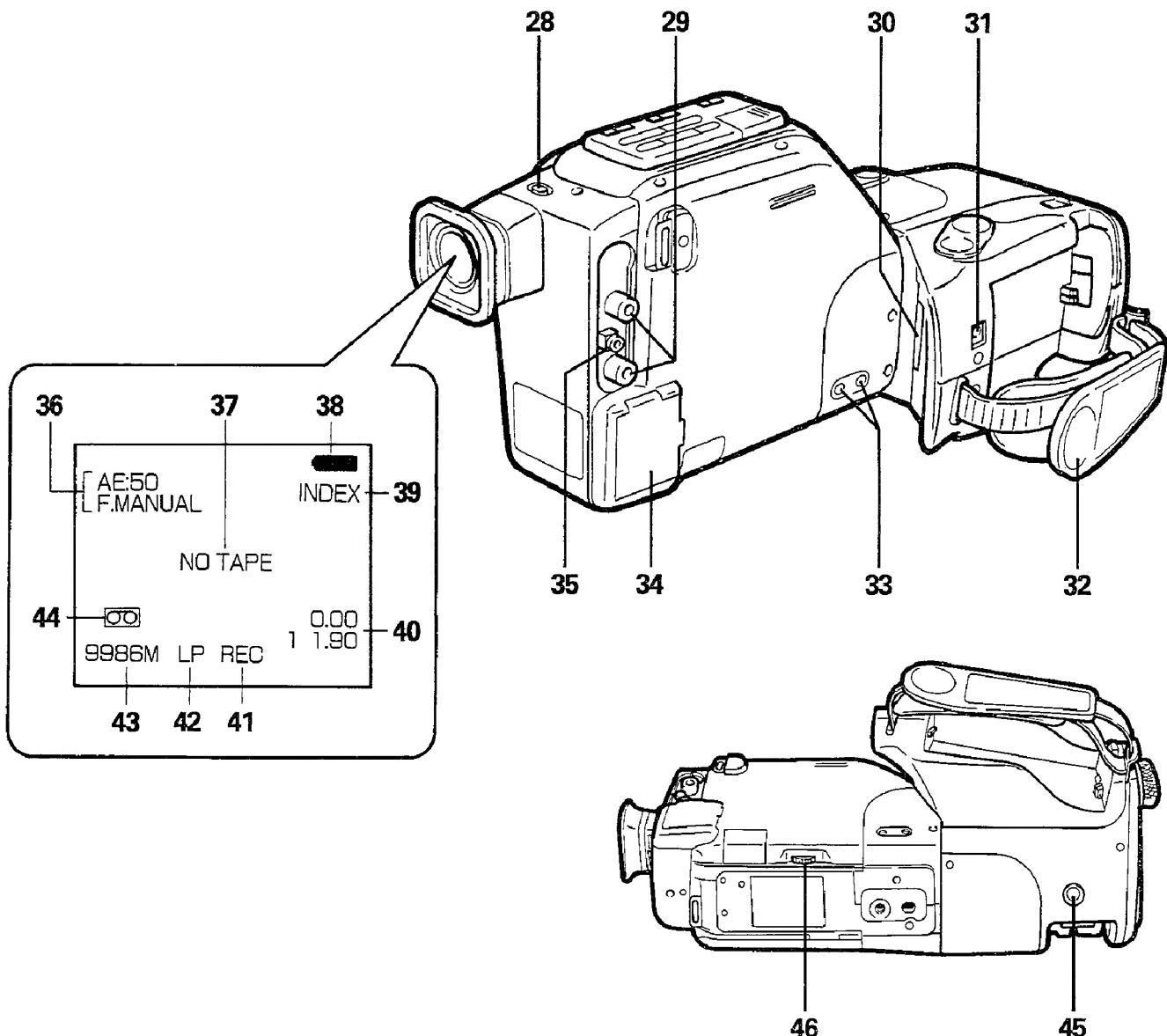
This switch selects the recording speed. "SP" provides the best picture quality but the shortest recording time (30 minutes with E-C30 tape).

"LP" provides slightly reduced picture quality, but longer recording time (1 hour with E-C30 tape).

### NOTES:

- Tape speed switch has no effect during playback. When playing tapes, the tape speed is selected automatically.
- "LP" is displayed in the viewfinder, but "SP" is not.

## CONTROLS AND FUNCTIONS



### 28. Eye Cup Release Button

If dust, etc. enters the viewfinder, press this button to remove the eye cup and remove the dust. (See page 25)

### 29. AUDIO/VIDEO OUT Jacks

Connect the audio/video output cable to these jacks and to the audio and video inputs of your TV/monitor receiver. You may also connect the RF converter unit between these jacks and your TV receiver.

### 30. Record Start/Stop Button

This button is used to control the camera/recorder. When this button is pressed with the camera/recorder set to the recording mode, the tape runs to start recording.

When this button is pressed again, the tape stops and the camera/recorder enters the record/pause (stand-by) mode.

### 31. DC 6V Jack

When using the AC adaptor/charger, connect one end of the DC cord (provided) to this jack and the other end to "DC OUTPUT" of the AC adaptor/charger. When using the car cord (optional), connect this jack and the car's cigarette lighter socket.

### 32. Hand Strap

Adjust to best fit to your hand.

### 33. DATE/TIME Set Buttons

These buttons are used to set the clock (time and date) in your camera/recorder so it can be recorded on your tapes for future reference.

### 34. Clock Battery Compartment

Pull the tab to open the cover and install the clock battery (provided).

### 35. RFU DC OUTPUT Jack

Connect the RF converter unit (optional) to this jack.

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**36. SHUTTER SPEED and FOCUS MODE Indicators**

These indicate the shutter speed and focus mode.

**37. TAPE Indicator**

When the camera/recorder is set to the camera mode and a cassette without its erase prevention tab is loaded, "NO TAB" flashes continuously. When a cassette is not in the camera/recorder, "NO TAPE" flashes for several seconds.

When the tape reaches the end and the remaining time is three minutes, "REM.3MIN" flashes. When you continue recording, flashing changes to "REM. 2MIN", "REM.1MIN" and "REM.0MIN", then "TAPE END" appears at the end of tape.

**NOTE:** "NO TAB" may also flash when there is no cassette in the camera/recorder.

**38. Battery Level Indicator**

Indicates the battery condition.

When the battery is fully charged, the display shows "████". When the battery is very nearly empty, the display shows "████". When "████" starts blinking, you should find an alternative power source or recharge the battery.

**39. INDEX Indicator**

See page 16 for details.

**40. DATE/TIME Indicator**

Indicate the date/clock during the record or record/pause (stand-by) mode. You can record the clock and/or date with object when recording.

**41. MODE Indicator**

Indicates the operating modes;

- "REC" appears and "→→" appears and moves during the record mode.
- "REWIND" appears during the rewind mode.
- "FASTFWD" appears during the fast forward mode.

**NOTE:** "→→", "REWIND" and "FASTFWD" appear only when the tape counter or tape remaining time is displayed.

**42. Tape Speed Indicator (LP)**

Shows the recording speed during recording and playback. Nothing is displayed when you select SP.

**43. TAPE REMAIN/COUNTER Indicator**

Shows the tape remaining or tape counter.

**44. TAPE Indicator**

-  : Shows that a cassette is inserted.
- E-C30: Shows the type of cassette tape.

**45. BLC Button**

When the subject is lit from behind, press this button for back-lighting correction. (See page 16)

**46. TRACKING Control**

Used when playing a tape recorded on another VTR. Adjust for best picture. At all other times leave it in the center position, which can be found as a small detent in the movement of the knob.

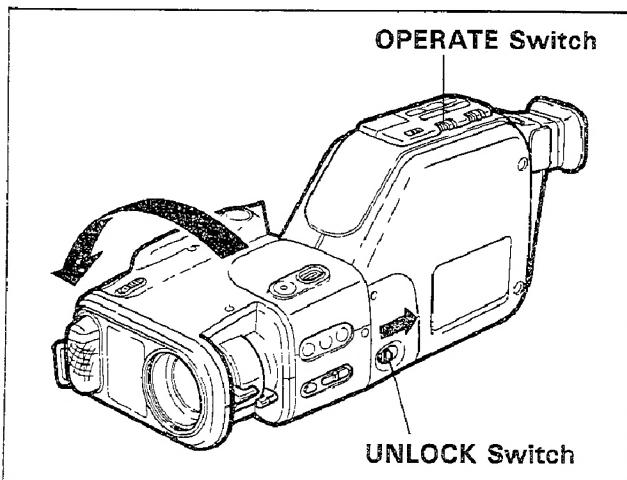
## **TWIST GRIP (Switching of Camera power/VTR power)**

Use this Twist Grip to switch the camera and VTR power on and off

### **To turn the camera on:**

Slide the UNLOCK switch in the direction of the arrow, and while holding it, twist the grip in the direction of the arrow until you feel a click.

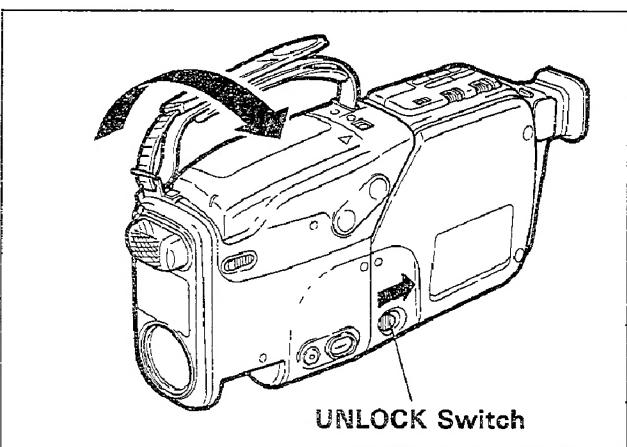
- The power is turned on automatically and the camera/recorder enters the camera mode.



### **To turn the VTR on:**

Slide the UNLOCK switch in the direction of the arrow, and while holding it, twist the grip in the direction of the arrow until you feel a click.

- The camera turns off automatically and the camera/recorder enters the VTR mode. To turn on the VTR, slide the OPERATE switch.



### **To turn power off:**

- To turn the camera off, twist the grip to set the camera/recorder to the VTR mode or slide the OPERATE switch.
- Slide the OPERATE switch to turn the VTR on or off.

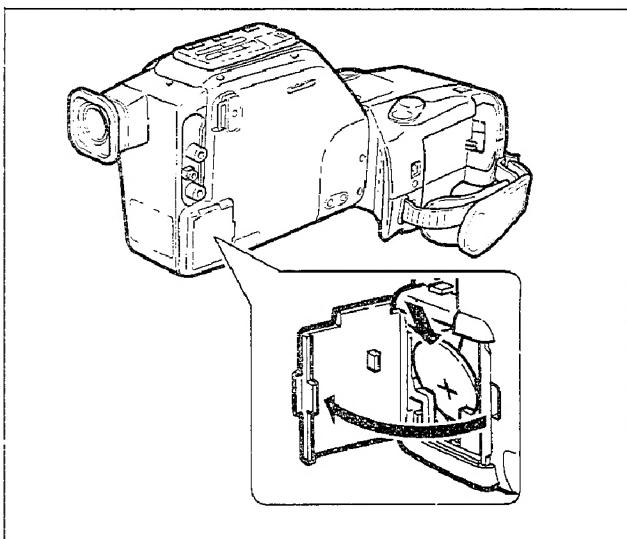
## **LOADING A BATTERY FOR DATE/CLOCK**

You may want to install the clock battery (provided) immediately to prevent misplacing it.

1. Pull the tab to open the cover and expose the compartment.
2. Insert the clock battery with the "+" terminal facing out (as illustrated inside the battery cover).
3. Gently push the cover closed until it snaps into place.

### **NOTES:**

- When replacing the batteries, use 3V micro lithium battery such as Maxell CR2025 or equivalent.
- Instructions for setting the time and date are on page 18. You can do that later if desired after you're more familiar with your camera/recorder.



This product uses a lithium battery which contains dangerous chemicals. Handle and dispose of with great care.

### **WARNING**

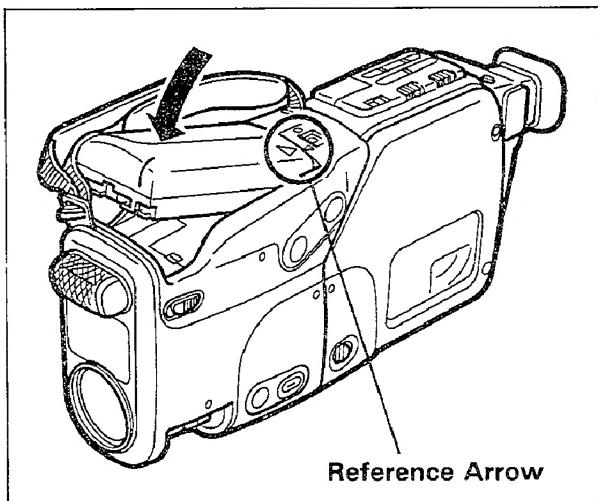
- Do not throw in a fire.
- Do not short circuit it.
- Do not disassemble it.
- After use please bring back to retail shop.

## POWER SOURCES

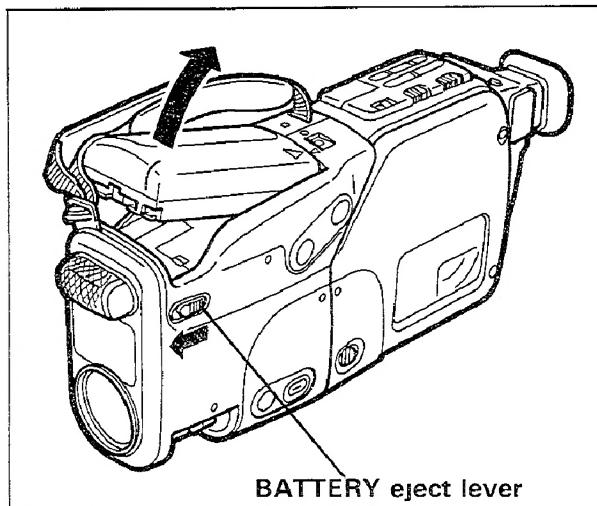
### ■ WHEN USING WITH THE BATTERY

For battery operation, you will need to attach the battery to the AC adaptor/charger first and charge the battery. (See page 11.)

1. Align the reference arrow on the battery with that on the camera/recorder.
2. Push the battery flush against the camera/recorder.



3. To remove the battery, pull the battery while sliding the BATTERY eject lever

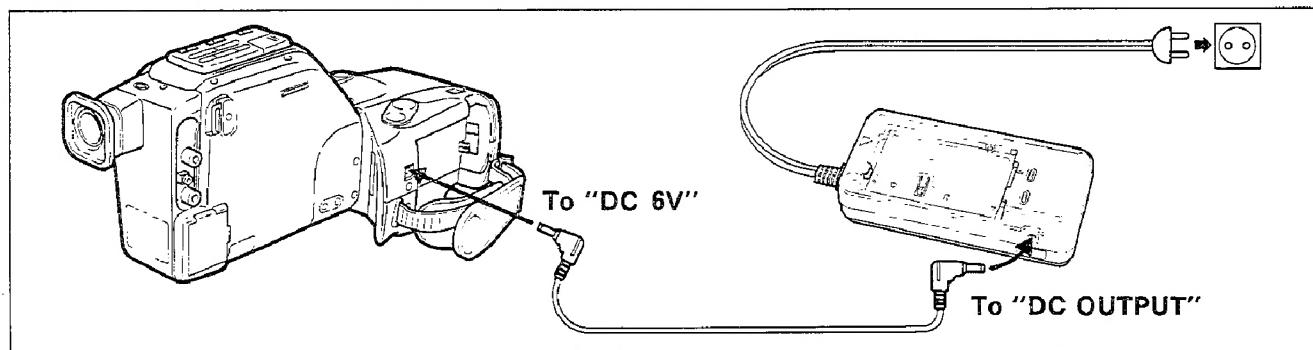


For use the battery pack, read the "CAUTION FOR BATTERY PACK" on page 27.

#### Battery Capacity

The full capacity of the battery provided allows about 55 minutes of recording at normal temperatures. But in practice, the recording time may decrease to 30 to 40 minutes, if the power zoom and auto focus are performed frequently.

### ■ WHEN USING WITH THE AC ADAPTOR/CHARGER



1. Plug the AC adaptor/charger power cord into AC electrical outlet.

**NOTE:** This AC adaptor/charger is universal for use with AC 100 – 240V around the world.

2. Connect one end of the DC cord (provided) to the "DC 6V" jack of the camera/recorder.

Connect the other end of the DC cord to the "DC OUTPUT" of the AC adaptor/charger.

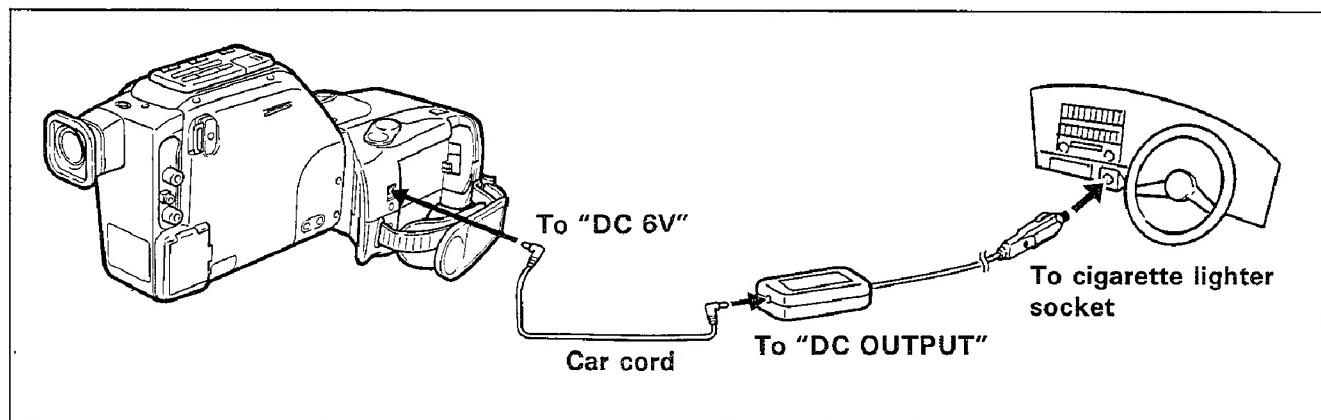
**NOTE:** The AC adaptor/charger cannot charge the battery and operate the camera/recorder at the same time.

Remove the battery from the AC adaptor/charger to supply power to the camera/recorder.

See the bottom of the AC adaptor/charger.

The rating label is located on the bottom of the AC adaptor/charger.

## ■ WHEN USING WITH THE CAR BATTERY (By using optional car cord Hitachi VM-CC80E)



1. Connect the car cord to the car's cigarette lighter socket.
2. Connect one end of the DC cord (provided) to the "DC 6V" jack of the camera/recorder. Connect the other end of the DC cord to the "DC OUTPUT" of the car cord.

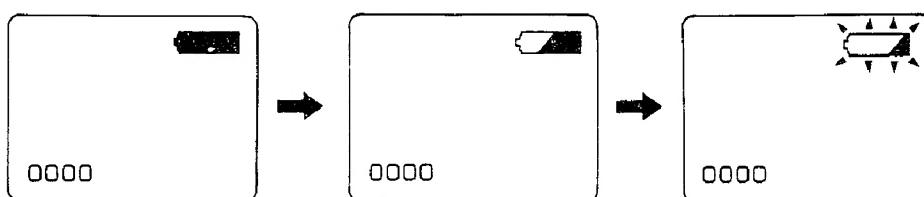
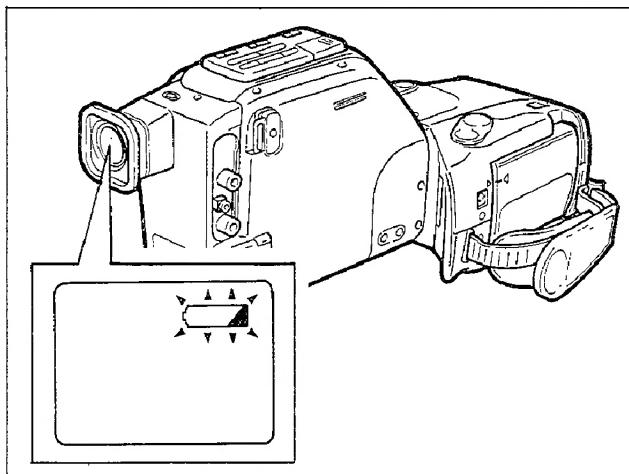
### NOTES:

- The car cord is designed to be used only with automobiles having a 12/24-volt negative ground system.
- To avoid possible damage to your camera/recorder, make sure the car cord you plan to use has positive tip polarity and is capable of converting 12/24 volts to 6 volts such as Hitachi model VM-CC80E.

## CHECKING THE BATTERY PACK

When the "■" indication in the electronic viewfinder appears and flashes while the video camera/recorder is operated with a battery pack during recording, it indicates that the battery charge is insufficient. Then, charge it or replace it with a charged battery pack.

**NOTE:** Whenever the tape counter or time remaining display is present in the viewfinder, the battery level indicator "■" is displayed in the viewfinder indicating the condition of the camera/recorder battery. When the battery is fully charged, "■" is displayed. After several minutes, the symbol will change to "■". When the battery is very near empty, the symbol will change to "■" and start blinking. You should find an alternative power source or recharge the battery before continuing to use your camera/recorder.

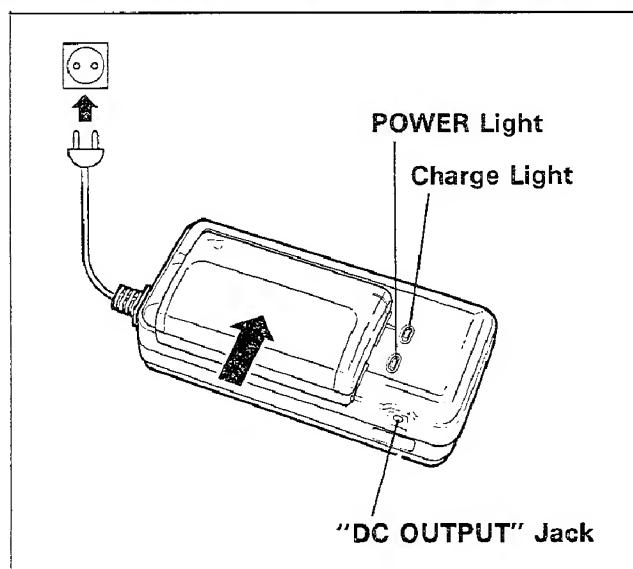


## CHARGING THE BATTERY PACK

1. Plug the AC adaptor/charger power cord into AC electrical outlet.
2. Attach the battery to the AC adaptor/charger. Align the reference arrow on the battery with that of AC adaptor/charger and push the battery flush with the AC adaptor/charger and slide it in the direction of arrow.

**NOTE:** You must remove the DC cord from the AC adaptor/charger to charge the battery. If the DC cord is connected, charge light will flash.

3. The charge light will be lighted while the battery is accepting a charge, and will go out when the battery is fully charged.



### NOTES:

1. The time required for charging the battery is approx. one hour.
2. Charging is not possible when a DC cord is connected to the DC output jack.
3. When a battery, which has become very hot, is attached to the AC adaptor/charger the "POWER" light of the AC adaptor/charger flashes. In this

event unplug the AC adaptor/charger from the AC outlet for approximately ten seconds. After that period the power cord may be plugged back into the AC outlet. Attaching an extremely hot battery to the AC adaptor/charger is not recommended; it should be allowed to cool down before being attached.

### NOTES:

- A battery pack will discharge on its own and its capacity will be reduced even if it is left unused. Be sure to charge before using it.
- When the camera/recorder is turned on, the capacity of the battery pack will be reduced even

if the camera/recorder is not recording. Turn off the camera/recorder when not using it.

- If the record pause mode is used too often or the battery is used at low temperatures, the time for which the battery can be used will be shortened.

## INSERTION AND REMOVAL OF CASSETTE

Before inserting or removing a cassette, be sure to connect the power source. When a power source is connected, the cassette can be loaded or ejected whenever the Twist Grip is set to the camera or VTR mode.

### ■ Insertion

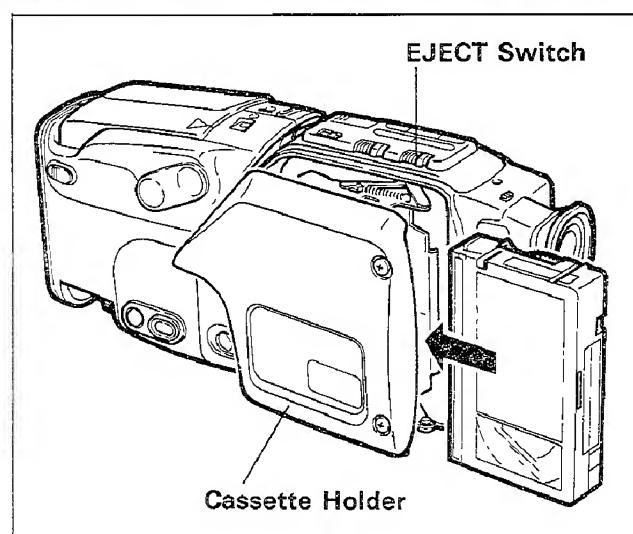
1. Slide EJECT switch and insert the cassette so the transparent window is toward you and the arrow toward the cassette holder. Slide the cassette into cassette holder as far as it will go.

**NOTE:** Before inserting a cassette, take up the tape slack by turning the cogwheel. Refer to page 21.

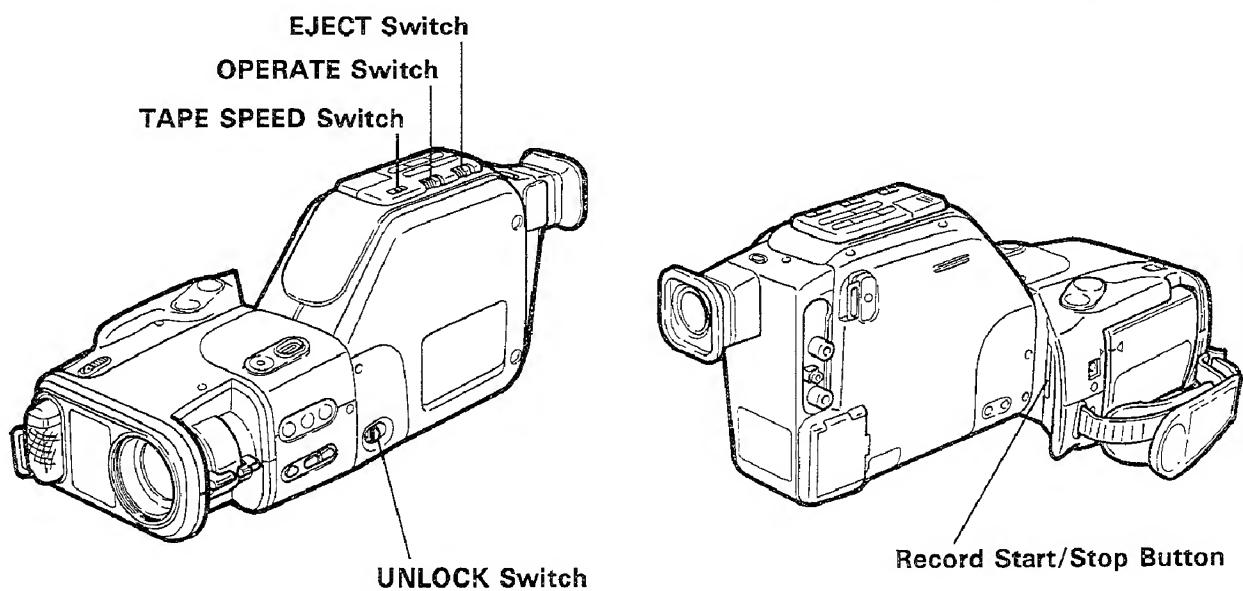
2. Press the cassette holder. The holder will latch in the operating position.

### ■ Removal

1. Slide EJECT switch and remove the cassette.



## CAMERA RECORDING



1. Connect either one of the "POWER SOURCES" on pages 9 and 10.
2. Insert the cassette so the transparent window is toward you and the arrow toward the cassette holder.
3. Slide the UNLOCK switch, and while holding it, twist the grip to turn the camera on. The camera/recorder will enter the record/pause mode automatically.
4. Set TAPE SPEED switch to either "SP" or "LP".
5. Now, press the record start/stop button to start recording the picture. You are now recording the picture you see through the electronic viewfinder. The "REC" indication in the electronic viewfinder will appear.
6. Press record start/stop button to stop recording. Press the button again to resume recording. The "REC" indication in the electronic viewfinder goes off in the record/pause (stand-by) mode.
7. After recording, slide the OPERATE switch or twist the grip to its original position to turn the power off.
8. Slide EJECT switch to remove cassette.
9. Always remove the power source from the video camera/recorder after use.

**NOTE:** If you have a cassette tape that has already been partially recorded on and you want to record the remaining blank section, see "QUICK EDIT" on page 24.

**NOTES:**

- If the erase prevention tab on the cassette is removed, "NO TAB" flashes in the viewfinder.
- If no cassette is loaded, "NO TAPE" flashes in the viewfinder for several seconds.

4. Set TAPE SPEED switch to either "SP" or "LP".

**NOTE:**

- When you select LP, it is displayed in the viewfinder, but when you select SP, no indication appears.
- SP will record 30 minutes and LP will record 60 minutes with an E-C30 tape.
- It is recommended that the TAPE SPEED switch is set to "SP" to obtain better picture and sound quality.

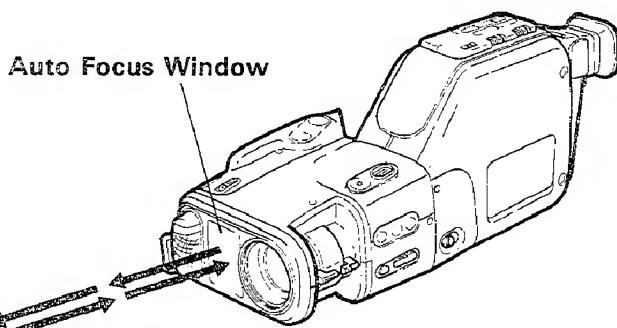
5. Now, press the record start/stop button to start recording the picture. You are now recording the picture you see through the electronic viewfinder. The "REC" indication in the electronic viewfinder will appear.

6. Press record start/stop button to stop recording. Press the button again to resume recording. The "REC" indication in the electronic viewfinder goes off in the record/pause (stand-by) mode.

7. After recording, slide the OPERATE switch or twist the grip to its original position to turn the power off.

## AUTO FOCUS

The auto focus system utilizes infrared light and will focus on the nearest object that reflects this light.



When the camera is turned on, normal subjects are automatically in optimum focus.

### ■ OBJECTS HARD TO AUTO FOCUS

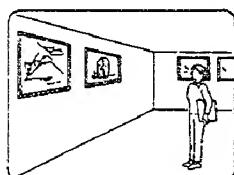
The distance between the auto focus window and the object is measured, and the focus ring is automatically turned for focusing. However, with the scenes such as shown below, the auto focusing may not operate properly. Then, perform the manual focus. See next page.



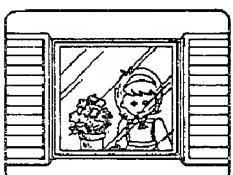
1. Object is not in the center.



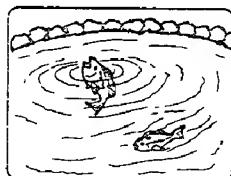
2. Objects in far and near positions at the same time.



3. Object with continuous variation from far to near positions.



4. Object behind glass.



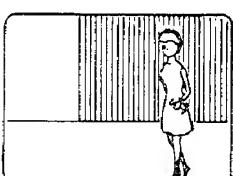
5. Black object or water which are hard to reflect infrared light.



6. Object always moving such as a crowd.



7. Object in the snow or fog.



8. Objects with equal pitches.

## ■ MANUAL FOCUSING

1. Press the FOCUS button to display "F.MANUAL" in the viewfinder.
  - When "F.MANUAL" is displayed in the viewfinder, you can adjust the focus manually.
  - When the FOCUS button is pressed again, "F.MANUAL" disappears and camera returns to the auto focus mode.

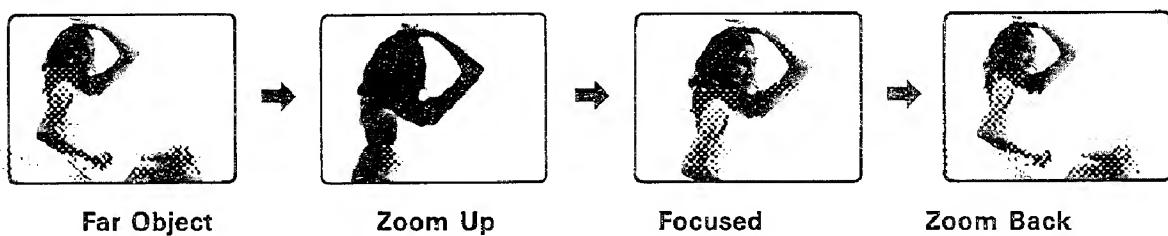
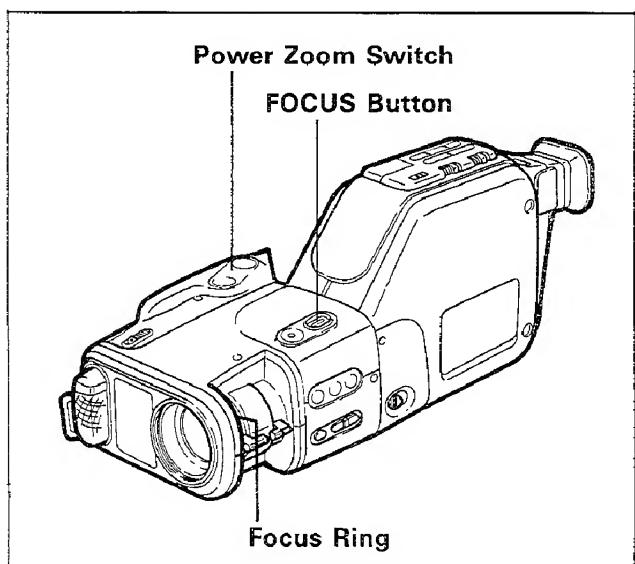
2. Zoom in on the object by pressing the power zoom switch on the "T" side.

3. Focus on the object by turning the focus ring.

**NOTE:** If focusing is performed without zooming up first, the picture may become out of focus when the zoom-up is done during actual picture taking.

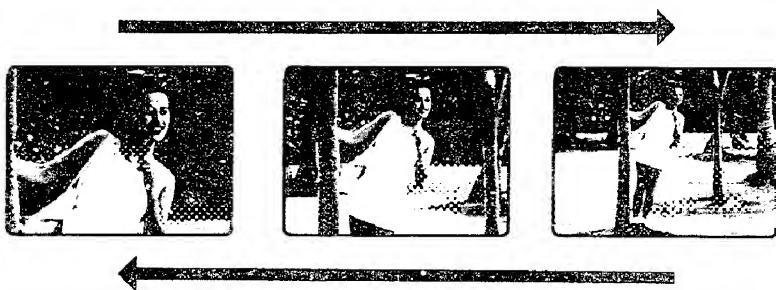
4. Then, zoom back the object as desired.

**NOTE:** After using the manual focusing function, press the FOCUS button to switch off "F.MANUAL" in the viewfinder.



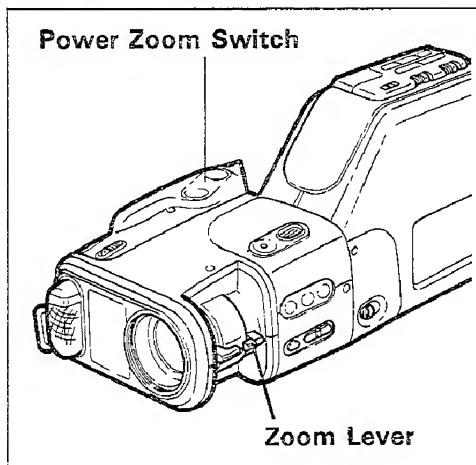
## POWER ZOOM

- Press power zoom switch on the "W" side, and the picture gradually widens.



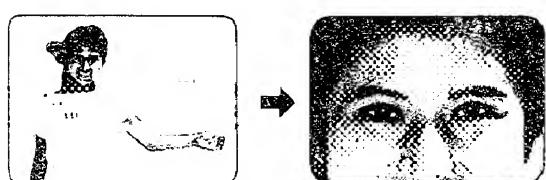
- Press power zoom switch on the "T" side, and the picture gradually becomes telescopic.

**NOTE:** Turn the zoom lever for manual zooming.



## ■ Super zoom (Telemacro) feature

Auto focus operates even when you bring the camera/recorder up to 80 cm from a subject, therefore, you can zoom up so the subject fills the screen and record it.

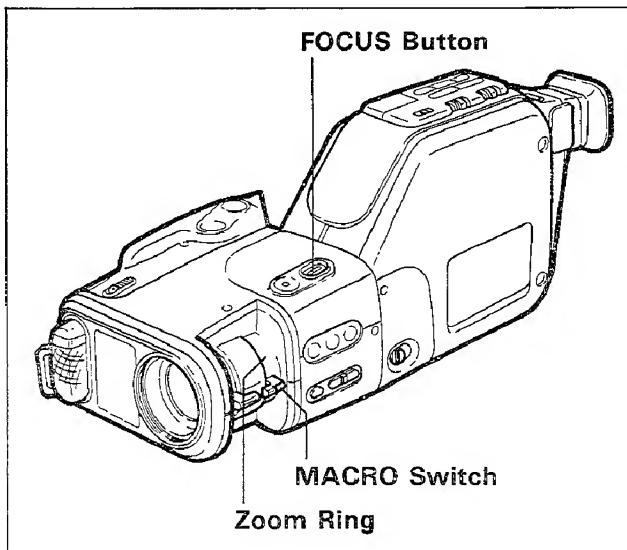


## MACRO

It permits you to shoot objects as close as 1 cm from the lens tip.

1. Press the FOCUS button to display "F.MANUAL" in the viewfinder.
2. Turn the zoom lever to "MACRO" while pressing MACRO switch.
3. Turn the zoom ring within the "MACRO" range (green line on the zoom ring) for focusing.

**NOTE:** After using the macro function, press the FOCUS button so that "F.MANUAL" disappears from the viewfinder and turn the zoom ring to release the macro mode.



## FADE-IN/FADE-OUT

This feature lets you add a professional touch to your home recordings. When you fade into a scene, the recording will start with a blank scene and the picture will gradually appear. The picture gradually disappears when fading out.

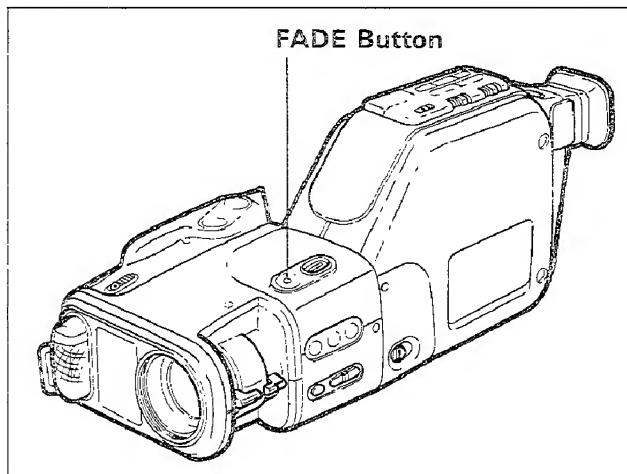
### ■ FADE-IN

1. While the camera/recorder is in the record/pause mode, press and hold FADE button.
2. Press record start/stop button to start recording.
3. Release FADE button after a few seconds. The picture will gradually appear on a blank screen.

### ■ FADE-OUT

1. While the camera/recorder is recording, press and hold FADE button. The picture will gradually disappear from the screen.
2. Continue to hold FADE button, and press record start/stop button to stop recording.
3. After the recording has stopped, release FADE button. The picture will reappear in the viewfinder.

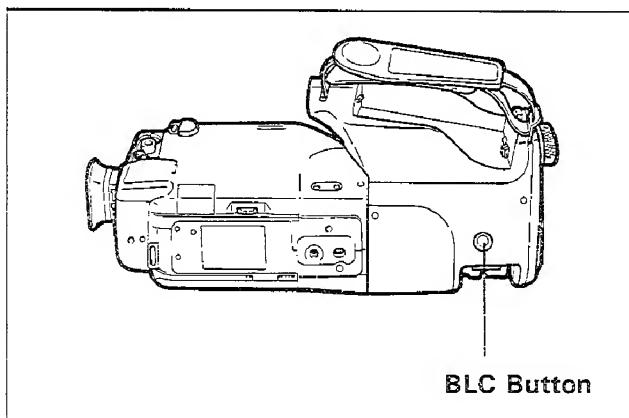
**NOTE:** When using FADE button, both picture and sound will gradually appear and disappear. The fade speed is automatically controlled by the camera/recorder.



## EXPOSURE CORRECTION

This camera/recorder is provided with an auto iris mechanism which automatically adjusts the lens aperture in accordance with the incident light. When the object is dark, the iris opens automatically, and it closes when the object is bright. When the power is switched off, the iris is automatically set to the fully closed position.

When the background is brightly lit and the subject appears too dark, press and hold down BLC button during recording. While you hold the button depressed, you can correct the back light.



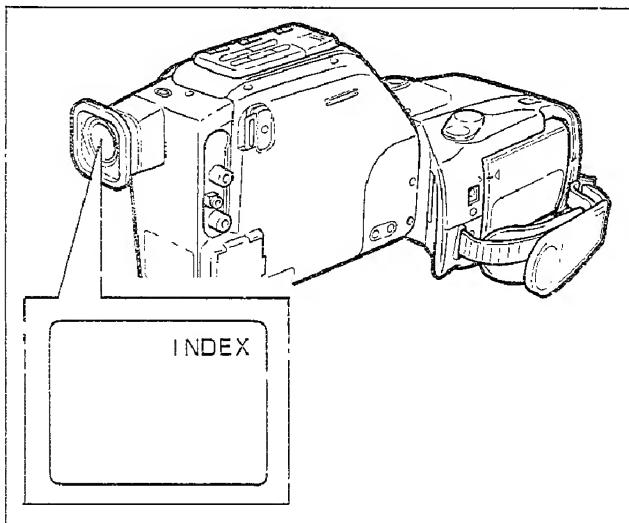
## INDEX SIGNAL RECORDING

Indexing your tapes while recording makes it easy to find desired programme segments when you play back the tape in a VTR that has a compatible indexing feature called the "VHS Index Search System". See your VTR's instruction manual for index playback instructions.

INDEX signals are recorded when the following operations are performed.

- When power is turned on about 4 hours after it is switched off and then recording is started.

**NOTE:** When an INDEX signal is recorded, "INDEX" disappears.



## PROGRAMME AE

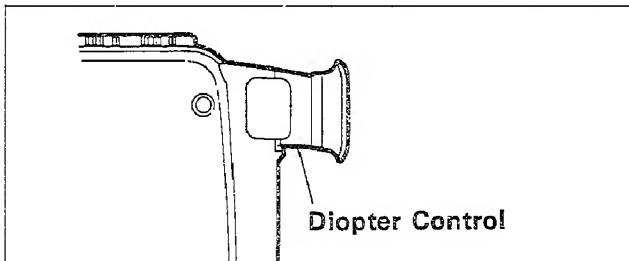
The brighter the subject, the faster the shutter speed. The darker the subject, the slower the shutter speed. This is an important point for recording subjects clearly. The VM-C1E adjusts the shutter speed automatically between approx. 1/50, 1/100, 1/250 and 1/500 seconds.

AE 100

Displays the shutter speed.  
Example: "AE:100" indicates approx. 1/100 seconds.

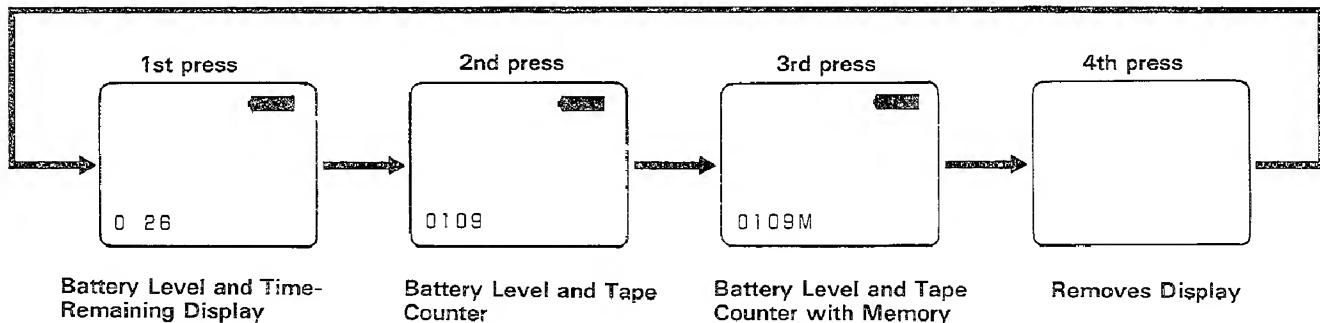
## DIOPTER CONTROL

To use the electronic viewfinder without eyeglasses on, adjust the diopter control for optimum focus adjustment.



## COUNTER MEMORY AND TAPE REMAINING

■ When the DISPLAY button is pressed, the displays in the viewfinder will change as follows.

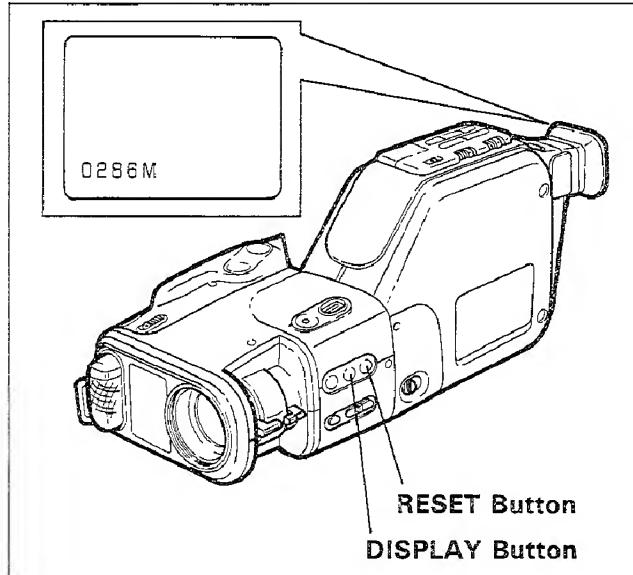


### ■ Counter Memory

When the tape counter with memory indication appears in the viewfinder, a tape that is being rewound automatically stops when the counter reads approximately "0000". This is useful if there is a section of tape you want to review immediately after recording or if you want to return to the same point several times in a row.

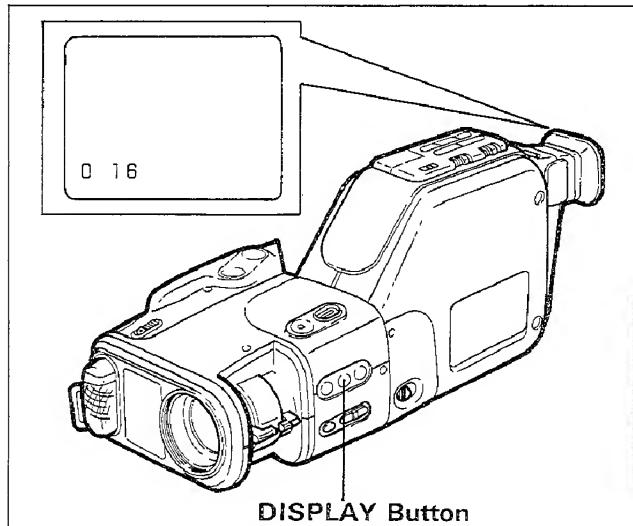
1. Press DISPLAY button until the tape counter with memory is displayed.
2. Start playing or recording a tape.
3. At the point you want playback to start, press RESET button to reset the counter to "0000".
4. Continue to play or record.
5. Press STOP button.
6. Press REW button. The tape will be rewound to the preselected point, at approximately "0000" indication.

NOTE: The tape will also stop approximately at "0000" during fast forward mode.



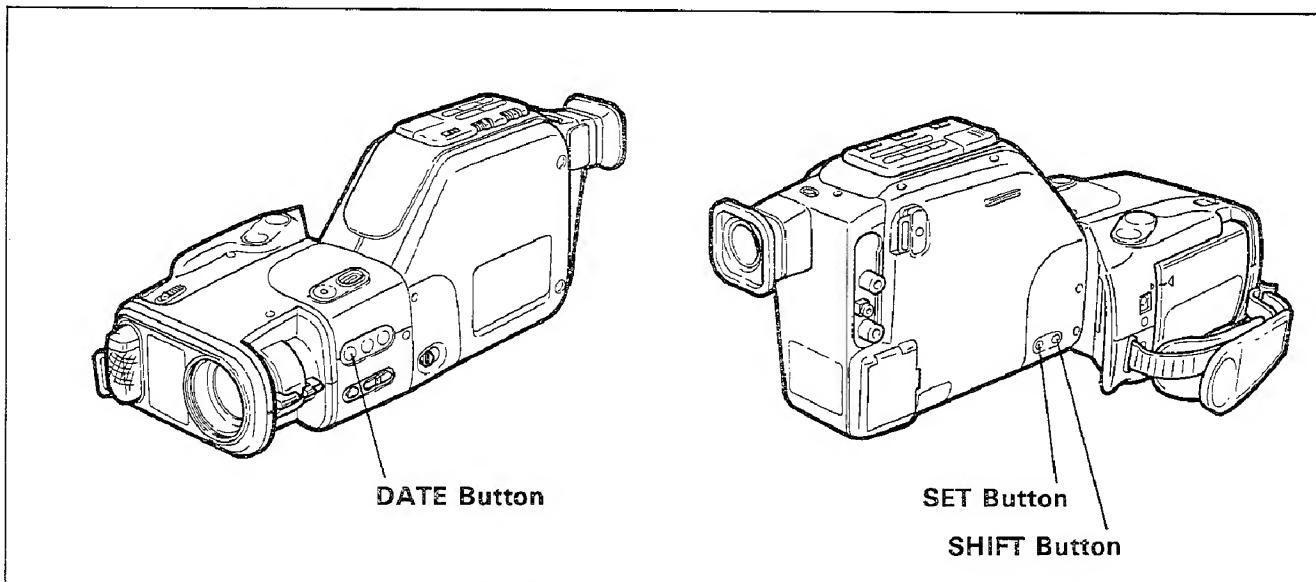
### ■ Tape Remaining

Press the DISPLAY button to display the tape remaining in the viewfinder; you can see the amount of recording or playback time left on the tape.



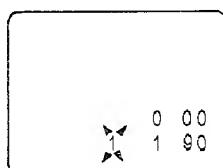
## DATE/CLOCK SETTING

The date and clock can be recorded on your tapes to act as a handy reference when the tapes are replayed. Since this camera/recorder has a dual time function, if you go abroad to a country with a time difference, you can also record the time at the site together. Use the following procedure to set up this display for the current date and time.

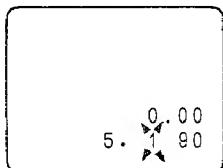


### To set the first clock

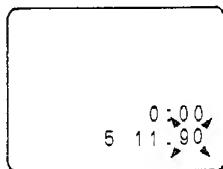
1. Load the camera/recorder's date/clock battery as described on page 8.
2. Twist the grip to turn on the camera power
3. Press DATE button.  
"0:00" and "1 1.90" appears in the viewfinder and "1" flashes.



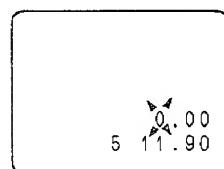
4. Press SET button to select correct date. Hold button down to advance rapidly. When the correct date appears, press SHIFT button.



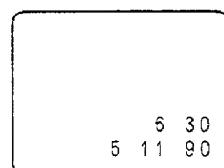
5. Press SET button to select correct month. Hold button down to advance rapidly. When the correct month appears, press SHIFT button.



6. Press SET button to select year, and then press SHIFT button.



7. Press SET button to select correct hour, and then press SHIFT button.
8. Press SET button to select correct minute.



9. After setting correct minute, press SHIFT button again to erase the flashing cursor and start the internal clock.

**NOTE:** To correct date/clock information during programming or after starting the date/clock, press SHIFT button until the incorrect digit is flashing. Then use SET button to enter the correct digit.

## To set the second clock

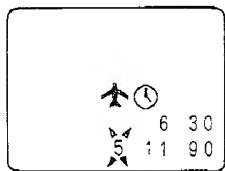
(The first clock operates even if you do not set the second clock.)

### Before setting:

Set the first clock first. The second clock cannot be set unless the first clock has been set.

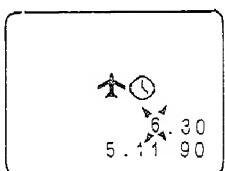
**Example:** When you go abroad where there is a time difference of -5 hours:

1. Press the DATE button to display the second clock.

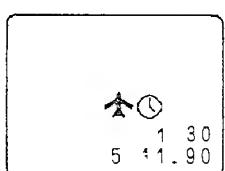


Before the second clock has been set, these indications are the same as the first clock.

2. Press the SHIFT button so to make the digit you want to set flash.



3. Press the SET button to input the correct number in the flashing digit.



4. Repeat steps 2 and 3 to set the date and time.

- The minutes of the second clock can not be set. They are the same as those of the first clock.
- The first clock operates even while the second clock is being set.

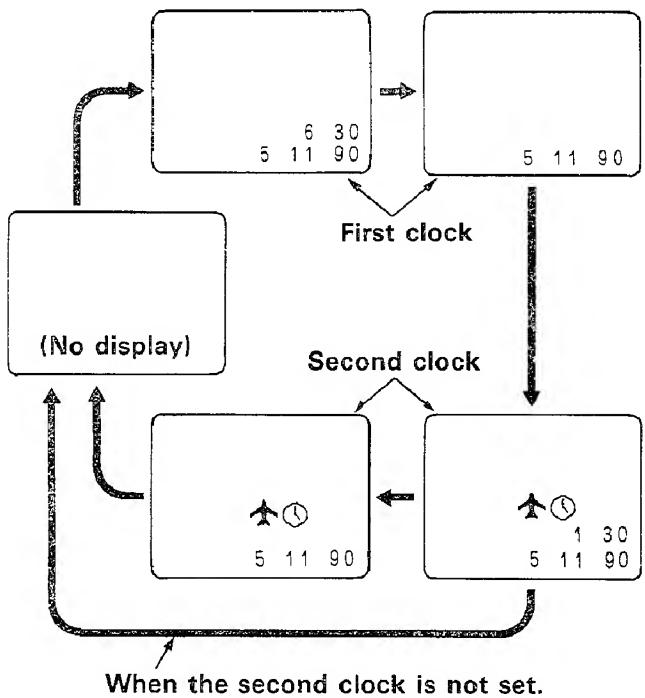
### NOTES:

- When the date or time of the first clock is flashing, you cannot delete the display.
- When you correct the minutes of the first clock, the minutes of the second clock are corrected automatically.

## To record the date and time

1. Select the display you want to record.

- Press the DATE button to select the display. The display changes in the following order.



2. Press the record start/stop button.

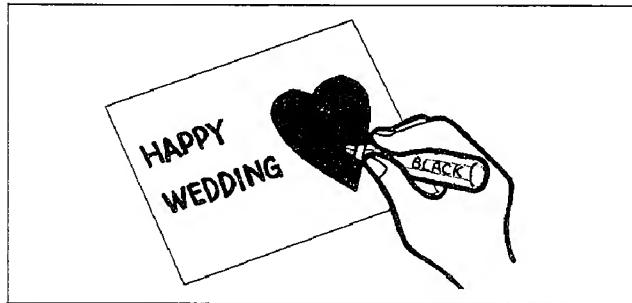
- The display is recorded.
- Press the DATE button to switch off the display. Press again to make the display selected in step 1 appear.
- When recording is started without the display and the DATE button is pressed, the date and time of the first clock are displayed. When the DATE button is pressed again, the display disappears.
- The date or time is not recorded while the display is flashing.
- " " of the second clock is not recorded.

## TITLE RECORDING

This function lets you store title and picture in memory. You can recall the stored title or picture from memory and superimpose it on the picture to be recorded.

### ■ Preparing a title and picture

Draw a title or picture with thick lines on a white sheet of paper using a dark pen such as a marker pen, etc.



### ■ Storing a title in memory of the camera/recorder

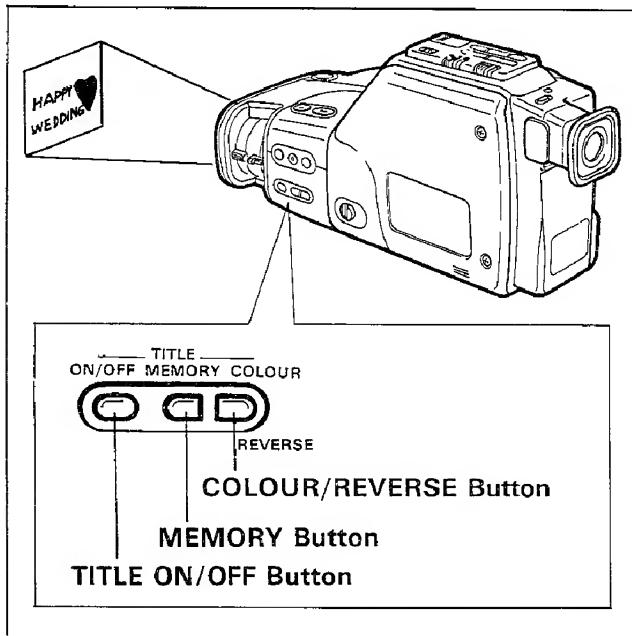
You can store a title in memory. Turn on the camera's power and perform the following procedure. (You need not load a cassette tape when storing a title in memory.)

1. Bring the title in focus. (Use the macro or super zoom up function to bring it into focus.)
2. Press the TITLE ON/OFF button.
  - A title picture appears.
  - When title has been stored in memory, the title picture is displayed.
3. Press the MEMORY button to store the title in memory. The previously stored title will be erased and the new title will be stored in memory.
4. Press the COLOUR/REVERSE button to select a colour of the title.
  - The colour changes from blue to green, red, white, black, cyan, magenta, yellow and back to blue each time the button is pressed.
  - When the colour changes, the title is once inverted between negative and positive.
5. Press the TITLE ON/OFF button.  
The title disappears from the screen but is stored in the memory of the camera/recorder.

- If a lithium battery is not installed, the title will be erased when the camera/recorder is turned off.

### ■ Recording a title

1. Press the TITLE ON/OFF button to display the title in the viewfinder during the recording or record/pause (standby) mode.
  - When the camera/recorder is in the record mode, the title is also recorded, superimposed on the picture.
  - When the camera/recorder is in the record/pause mode, display the title and then press the record start/stop button.
2. Press the TITLE ON/OFF button to stop inserting the title.
  - The title disappears, but recording continues.

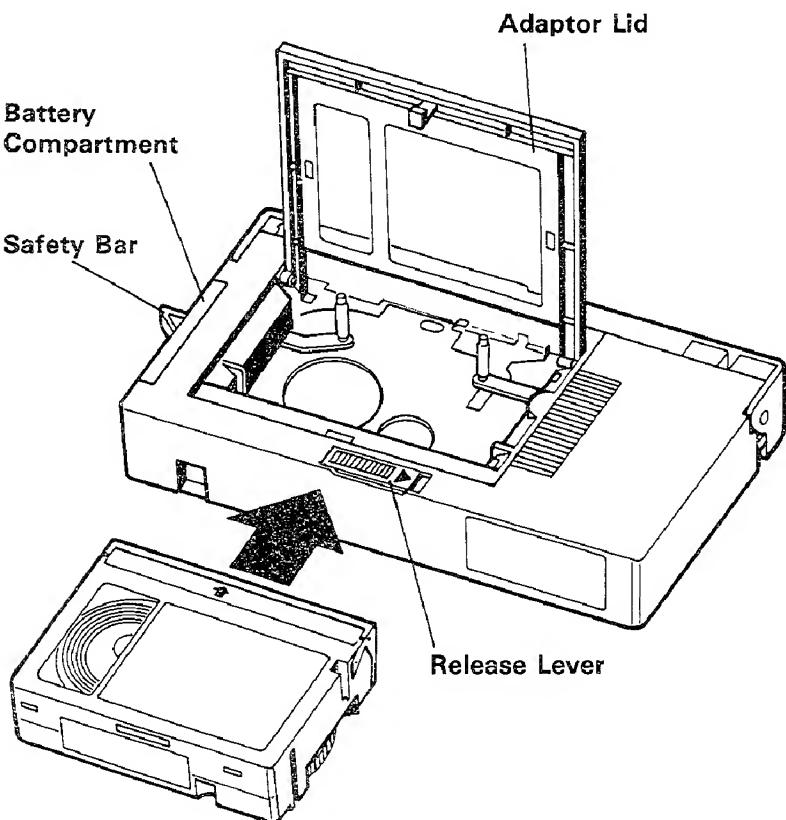


### NOTES:

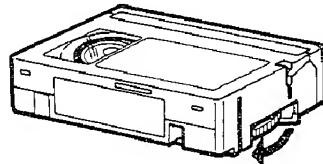
- The display showing the colour of the title is not recorded.
- When the COLOUR/REVERSE button is pressed even after the title is displayed, its colour can be changed and inverted.
- The title can be recorded whenever and wherever you want when the TITLE ON/OFF button is pressed.

## PLAYING BACK VHS-C CASSETTES WITH STANDARD VHS VTR

The cassette adaptor (optional accessory) allows you to play back your VHS-C tapes directly in a standard VHS home VTR. Simply insert the VHS-C tape in the adaptor as described below and then insert the adaptor in your VHS VTR as you would a normal VHS tape.



Before inserting VHS-C cassette into the adaptor, take up the tape slack by turning the cogwheel in the direction of arrow.

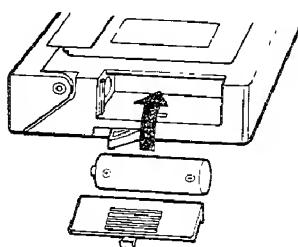


### Care of Adaptor

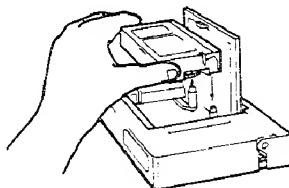
- Store and handle your cassette adaptor so that it is not subjected to swinging, shaking, or dropping. The adaptor can be damaged by improper storage or handling.
- If you are not using your adaptor, remove the battery from it.
- Do not touch the tape surface when inserting it into the adaptor or removing.

### Inserting VHS-C Cassette into Adaptor

1. Open battery compartment and insert one "IEC R6" battery. Make sure + and - ends are inserted correctly as shown inside battery compartment.
- Replace battery cover.



Insert cassette straight down on top of the two white posts.



4. Close the lid. Motor will drive two loading posts to move tape into position inside the adaptor.

Note that the red safety bar also retracts so that the adaptor can now be inserted into a VHS VTR like a normal VHS cassette.

2. Slide Release Lever to the right to open adaptor lid.
3. Insert VHS-C cassette, with tape window facing up and to the left.

### Removing VHS-C Cassette From Adaptor

1. Slide release lever to the right to open adaptor lid.
- Motor will retract the tape back into the VHS-C cassette and open the adaptor lid.
2. Insert one of your fingers through the small hole in the bottom of the adaptor and push the small cassette up until you can easily remove it.

3. Close adaptor lid.

**NOTE:** When the battery in the battery compartment is discharged, the VHS-C cassette cannot be removed. Do not open the adaptor lid forcibly.

Replace the battery with a new one to remove the cassette.

## **VIEWING THE PICTURE PLAYED BACK ON YOUR TV**

To play back a tape recorded on your camera/recorder and view it on your TV receiver, you must connect the camera/recorder to the TV receiver using either audio/video output cable or RF converter unit.

You also may play back the tape recorded by your camera/recorder on any other VHS video tape recorder\*. The camera/recorder records and plays back at the VHS standard speed (SP) or long play (LP).

\* Some table-top VTR cannot play tapes recorded in LP. SP recorded tapes can be played back by any other VHS table-top VTRs.

### **Example 1: If you have a VHS video tape recorder**

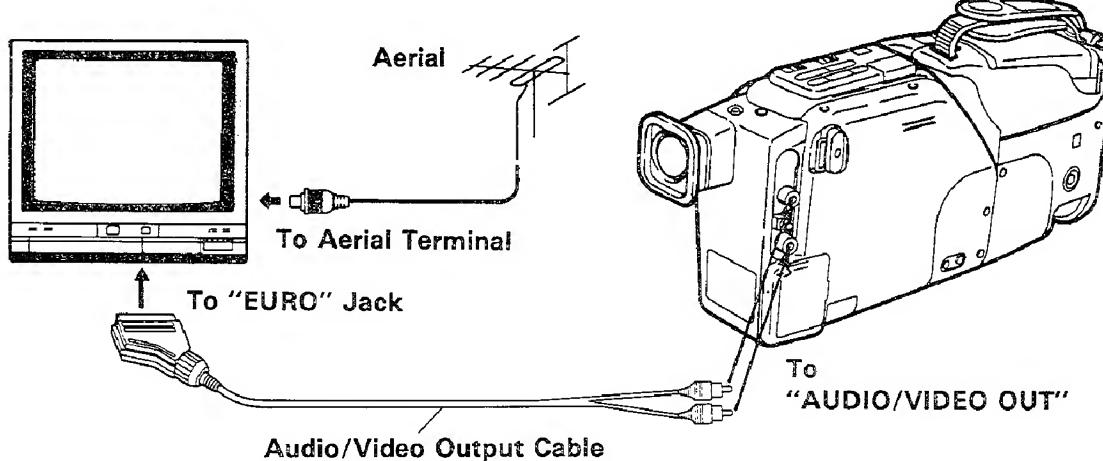
1. Insert the video cassette recorded by your camera/recorder into the cassette adaptor (optional accessory).

Then inset the cassette adaptor into a VHS VTR.

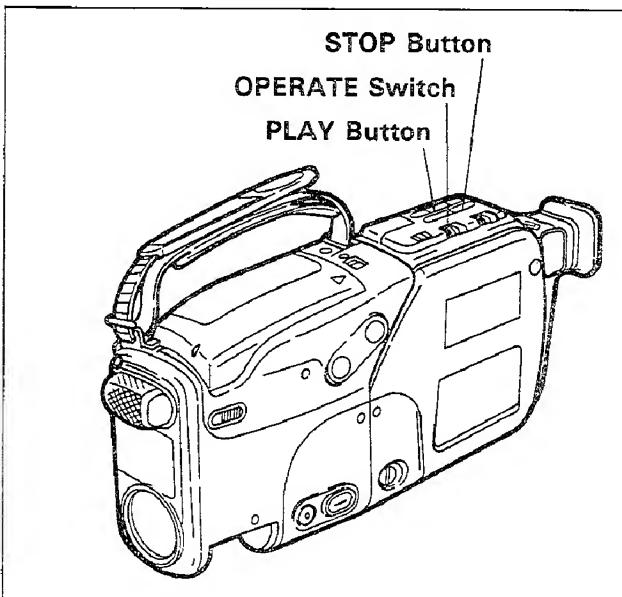
Refer to "PLAYING BACK VHS-C CASSETTES WITH A STANDARD VHS VTR" on page 21.

2. Press PLAY button on the VTR.

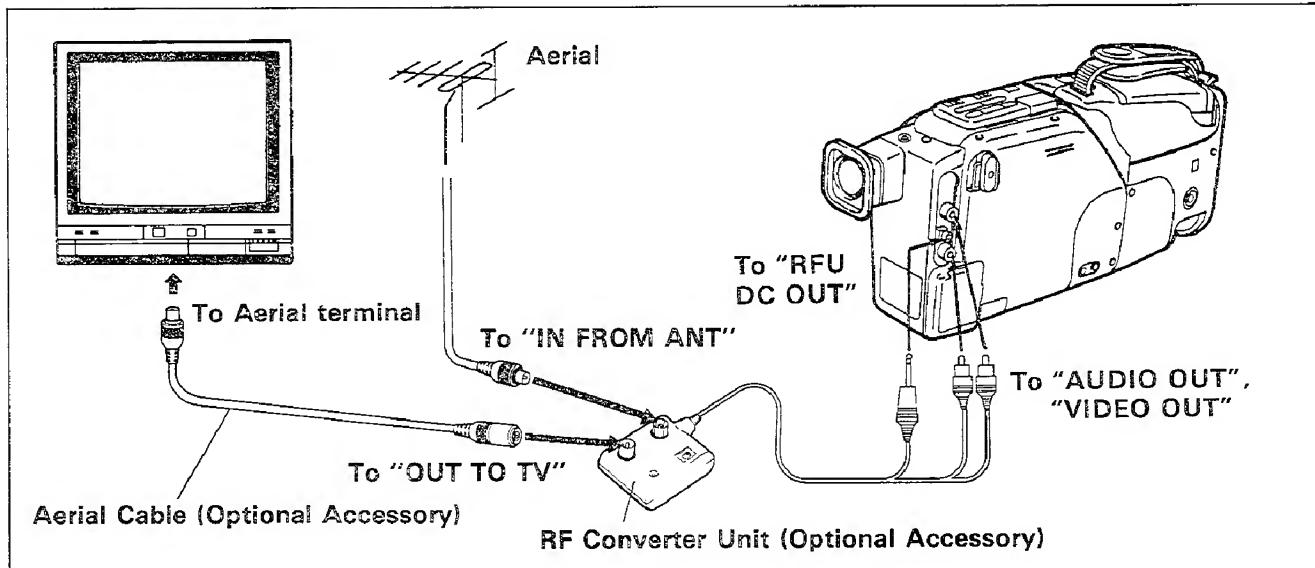
### **Example 2: If your TV has "EURO" jacks,**



1. Connect the audio/video output cable to "EURO" jack of your TV.
2. Connect the other end of the audio/video output cable to "AUDIO" and "VIDEO" outputs of your camera/recorder
3. Turn on TV and select video input.
4. Insert the cassette.
5. Slide the OPERATE switch to turn on the VTR.
6. Press PLAY button.
7. After playing press STOP button.



Example 3: If your TV is a regular TV,



1. Remove the antenna cable from your TV set. Connect this cable to "IN FROM ANT" on the RF converter unit.
2. Connect the aerial cable to "OUT TO TV" on the RF converter unit.
3. Connect the other end to aerial terminal on your TV.
4. Connect the connector cable from RF converter unit to "AUDIO OUT", "VIDEO OUT" and "RFU DC OUT" on the camera/recorder.
5. Turn on the TV and select an unused channel (CH37). Refer to "VIDEO CHANNEL SETTING" below.
6. Perform same procedures in steps 4 through 7 of "Example 2" on page 22.

**NOTE:** If you want to watch a TV programme with the camera/recorder connected as shown, turn off the VTR power, or disconnect the connector cable of RF converter unit from the "RFU DC OUT" jack on the camera/recorder.

## VIDEO CHANNEL SETTING

When viewing the picture played back by the camera/recorder on your TV, change over the I/G select switch of the RF converter unit matching your TV as well as to select the video channel on the TV.

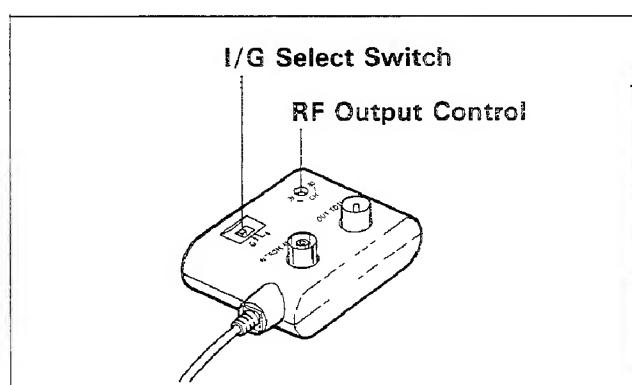
1. Connect TV, RF converter unit and camera/recorder. (See above)
2. Set I/G select switch on RF converter unit as follows.

Colour TV broadcast system in your country	Position of I/G Select Switch
PAL (System I)	I
PAL (System B & G)	G

3. Turn on TV and select an unused channel (CH37). (In some cases this may be marked A/V.)
4. Insert the recorded tape to camera/recorder.
5. Slide the OPERATE switch to turn on the VTR.
6. Press PLAY button of camera/recorder.

Now playback picture appears on your TV.

If the playback picture is not clear or channel 37 is used for broadcasting in your area, adjust the RF output control of RF converter unit using a small screwdriver and readjust your TV until the playback picture is clearly observed.

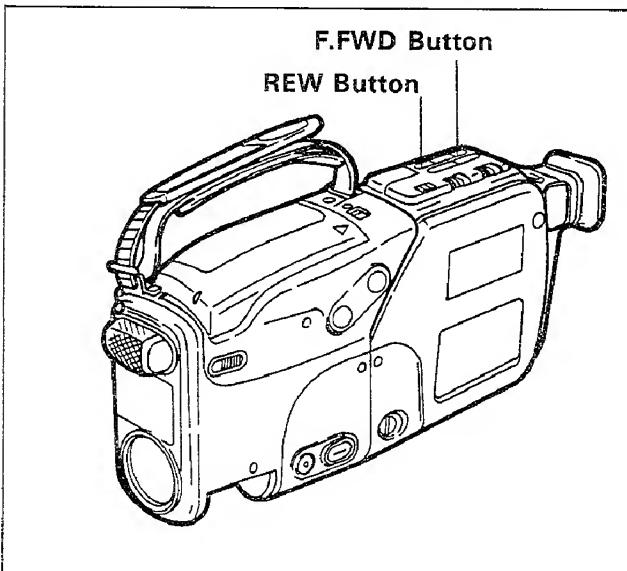
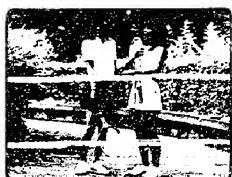


## F-SEARCH AND R-SEARCH

When you press F.FWD or REW button during playback, the tape will be played back at a speed about 3 times faster than the normal playback speed (SP recorded tape) or 7 times faster than the normal speed (LP recorded tape), and you can easily locate a certain spot on the tape.

### NOTES:

- There will be some noise (interference) in the F-search and R-search picture. The noise will be much more pronounced when playing tape recorded with speed switch set to SP.
- Colour may disappear or the picture may fluctuate up and down.
- Skew occurs, but this does not indicate a fault.

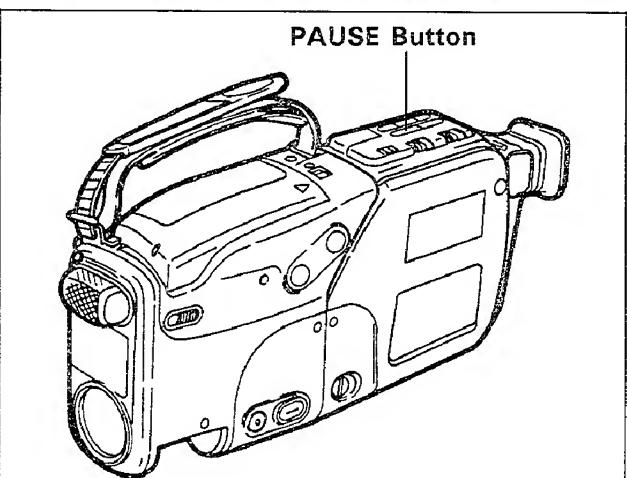


## STILL

When PAUSE button is pressed during playback, a still picture can be seen. To start again press PAUSE button and playback will be resumed.

### NOTES:

- There will be some noise (interference) in the still picture. The noise will be much more pronounced when playing tape recorded with speed switch set to SP.
- Colour may disappear or the picture may fluctuate up and down.
- When the still playback mode continues for about 5 minutes, the camera/recorder switches to the stop mode automatically to prevent damage to the tape.
- Skew occurs, but this does not indicate a fault.



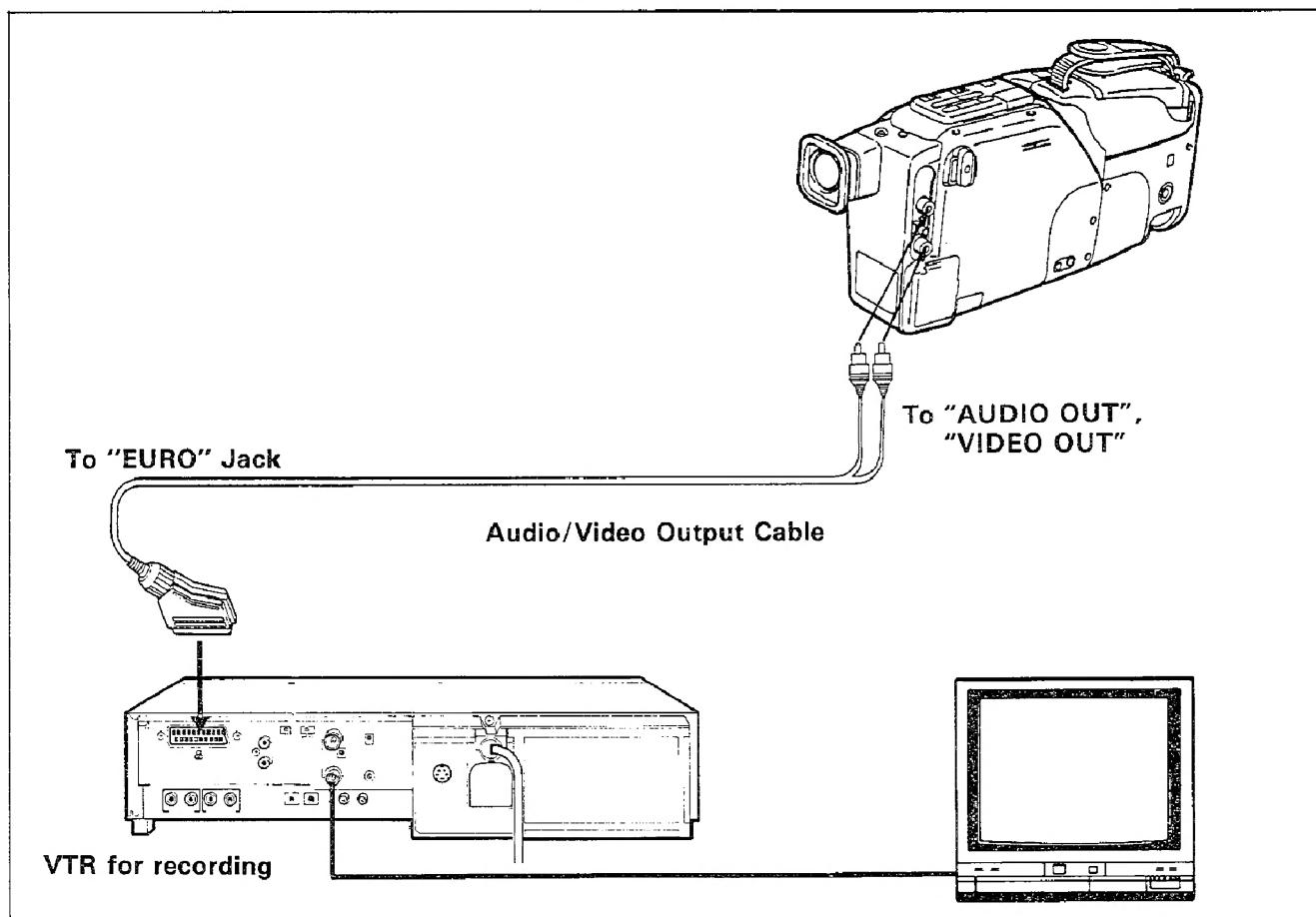
## QUICK EDIT

Visual scanning can be performed while F.FWD or REW button is held depressed in the record/pause (stand-by) mode. And also when PLAY button is pressed in the record/pause mode, playback can be done while it is held depressed. Use this feature to search for the end of the previously recorded material in the record/pause mode when you are going to record a new program on the remaining blank section of the tape.

## FLYING ERASE HEAD

A rotating erase head eliminates glitches and rainbow noise that occurs at the joints between recordings in previous models.

## CAMERA/RECORDER TO VTR DUBBING

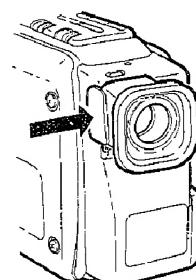
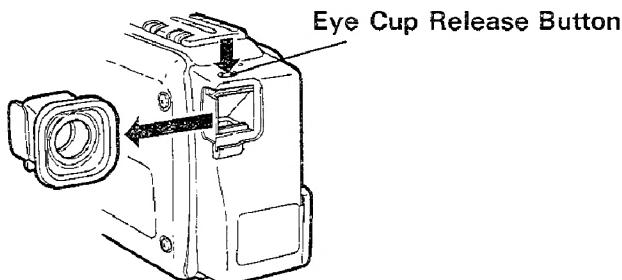


1. Connect the camera/recorder, VTR and TV as shown in the figure, and then turn on their operate switches.
2. Insert the cassette used for editing into the camera/recorder and the cassette to be recorded into the VTR.
3. Play the tape in camera/recorder and record it with the VTR.

### CLEANING THE INSIDE OF THE ELECTRONIC VIEWFINDER

If dust or foreign matter adheres inside the viewfinder, clean it by the following procedure.

- 1 Remove the eye cup.  
Slide the eye cup in the direction of the arrow while holding the eye cup release button depressed.
3. Attach the eye cup.  
Slide the eye cup in the direction of the arrow while holding the eye cup release button depressed.



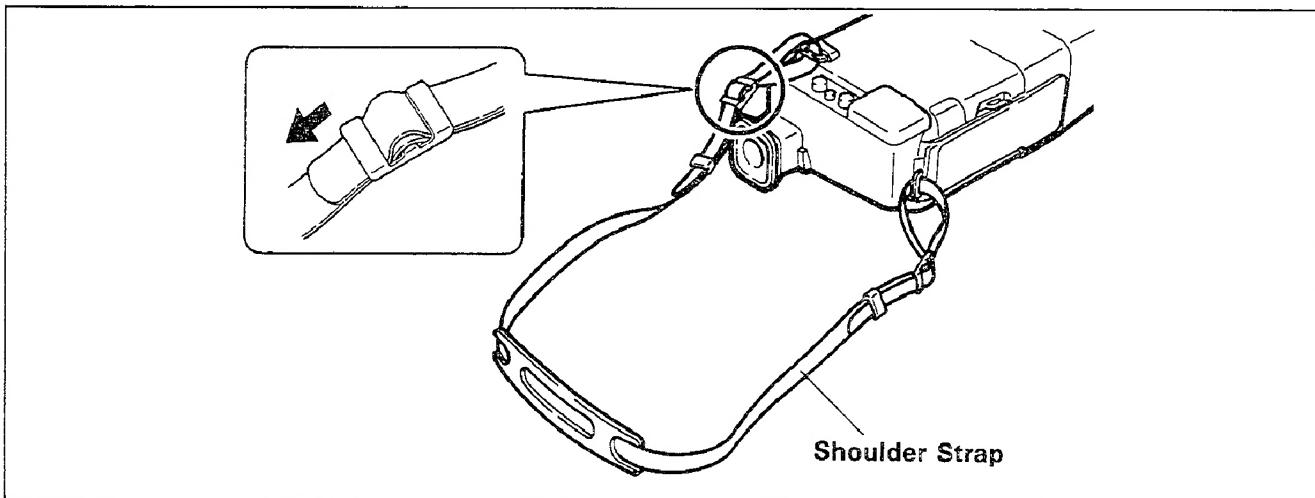
2. Clean picture tube face and lens.  
To prevent scratching, use a soft non abrasive cloth, swab or lens cleaning paper.

## TROUBLESHOOTING

Symptom	Check Point & Correction
Cassette holder cannot be opened when you press EJECT button.	Connect the power source.
Cassette cannot be inserted into cassette compartment.	Load cassette in direction indicated by arrow on cassette.
Picture does not appear in the viewfinder.	Connect the power source.
The camera/recorder will not go into the recording mode, even when record start/stop button is pressed.	The cassette has had the erase prevention tab removed. Stick a piece of cellophane tape over the erase prevention hole or select a different cassette.
	The "  " indication in the electronic viewfinder flashes to indicate battery is discharged. Try another battery or charge the battery.
PLAY button cannot be engaged.	Turn on VTR power.
Interference on playback picture.	Adjust TRACKING control. When you see the playback picture on your TV, adjust fine tuning knob on television set to obtain the best picture.
Picture is out of focus. Auto-focus does not operate.	Press the FOCUS button to turn off "F.MANUAL" in the viewfinder. The video camera/recorder is set to "MACRO" mode. Release the "MACRO" mode.

## HOW TO INSTALL THE SHOULDER STRAP

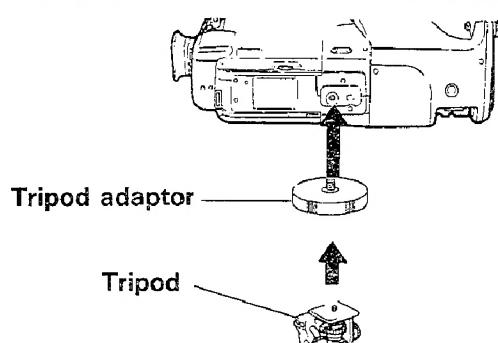
Attach the shoulder strap as illustrated below.



### How to use the tripod adaptor

When you mount the camera/recorder on a tripod, always attach the tripod adaptor provided to the camera/recorder as shown in the figure.

If you do not attach the tripod adaptor, the camera/recorder could be broken when its grip is twisted to turn the camera power on.



## MAINTENANCE

1. To maintain the optimum performance of this camera/recorder, regular periodic maintenance is required. Your dealer will advise you further.
2. Maintenance and adjustments may not be carried out by the user. In all cases of difficulty or doubt, consult your dealer.
3. Head cleaning
  - Dirt accumulated on the video heads after a period of time may cause the playback picture to become blurred or part of the video information to be lost. This does not mean that the recorded programme has been erased but head cleaning is required which must be carried out by your dealer.

- Under no circumstances we do recommend users to attempt to clean the video heads as this is done only effectively by removal of the cover to gain access to the video heads and other parts which require cleaning, which would expose live conductors and present a "shock" hazard.
- In regard to the various head cleaning tapes which are currently available on the market, these can cause damage and also reduce the operational life of the video heads if used incorrectly. Please consult your dealer as to the suitability of any cleaning aids before purchase.

## SPECIFICATIONS

### ■ General

Power requirements	6V DC
Power consumption	6.8 watts (when the manual focus mode is selected)
Dimensions	69(W) x 120(H) x 280(D) mm
Weight	0.98 kg
Operating temperature	0°C ~ 40°C
Storage temperature	-10°C ~ 50°C

### ■ Video Recorder Section

Format	VHS
Record/playback system	Four video record/playback heads
Video signal	PAL colour & CCIR monochrome signals 625 lines
Tape speed	SP: 23.39 mm/sec., LP: 11.7 mm/sec.
Video output	1.0 Vp-p, 75 ohm
Audio output	300 mV, less than 1K ohm

### ■ Camera Section

Scanning	625 lines/50 fields/25 frames
Required minimum illumination	7 lux
Camera device	1/2" CCD image sensor
Lens diameter	37 mm

### CAUTION FOR BATTERY PACK

1. Recharge before each use.
2. Recharge in a place 0°C to 35°C.
3. Use specified charger only.
4. Do not put into fire.
5. Do not short-circuit battery.

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